

PARAINFLUENZA BACKGROUND

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BIOLOGY AND EPIDEMIOLOGY

- Single-stranded, enveloped, RNA viruses (Paramyxoviridae family).¹
- Virus is divided into 4 serotypes “with HPIV4 subdivided into two genera (HPIV4a and HPIV4b).”¹
- Pathogenesis: human parainfluenza viruses (HPIVs) target and infect ciliated epithelial cells of the upper and lower respiratory tracts.¹
- “Severe disease and fatal pneumonia may occur in elderly and immunocompromised adults.”¹
- It is estimated that only 1% of respiratory illnesses in adults are caused by human parainfluenza viruses resulting from waning immunity and reinfection after childhood.¹
- The CDC reports that transmission occurs through direct person-to-person contact or respiratory droplets.²
- Infections typically occur:¹
 - HPIV1 – biennial outbreaks during the fall of odd-numbered years
 - HPIV2 –annually in the fall
 - HPIV3 – seasonal outbreaks in the spring
 - HPIV4 infections have not been well studied.
 - Commonalty of serotypes
 - HPIV3 (52%)
 - HPIV1 (26%)
 - HPIV2 (12%)
 - HPIV4 (2%)
- Reports list human parainfluenza viruses as the “second most common cause of acute respiratory tract infections” in children under the age of 5, accounting for “up to 17% of [child] hospitalizations.”³
- Serological studies suggest that by the age of 6, the vast majority of children will have been infected by HPIV3.³
- By the age of 10, 70% to 80% of children will have developed antibodies against the remaining human parainfluenza viruses serotypes.³



COMMON SYMPTOMS

- Fever, runny nose, cough, croup, pneumonia, sore throat, wheezing, ear pain.⁴

DIAGNOSIS

- Detection of virus by culture, fluorescent antibody assays, or some other molecular assays using PCR.⁵

TREATMENT

- Currently no antivirals available.
- Corticosteroids are primarily used to treat croup symptoms, while the use of nebulized epinephrine is associated with short-term relief of symptoms after 30 minutes. However, the benefit of nebulized epinephrine generally disappears after 2 hours.¹
- Treatment regimens “utilize aerosolized or systemic ribavirin in combination with intravenous immunoglobulins and/or corticosteroids.”¹
 - Ribavirin is a synthetic nucleoside analog normally used to treat RSV.
 - Despite its use, there does not seem to be much in the scientific literature on its actual effectiveness in treating human parainfluenza viruses.
 - The drug DAS181 appears promising in efforts to treat severe disease in immunocompromised patients.
 - “DAS181 is an inhaled recombinant sialidase fusion protein that interferes with the initial binding of HN with the host cell sialic acid containing receptor.”¹
 - Currently in Phase 2 clinical trials as a treatment option for infected individuals who are immunocompromised.¹

REFERENCES

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